

REMARKS

Claims 1-10 and 45-63 currently remain in the application. Claim 1 has been amended. Please Cancel claims 11-44 in response to the restriction requirement and without prejudice to further prosecution. Please add claims 45-63.

Rejections under 35 U.S.C. § 102

The Examiner rejected Claims 1-3, 9 and 10 are rejected under 35 U.S.C. §102(b) as being unpatentable over U.S. Patent No. 6, 048, 622 (Hagood et al.). Applicants respectfully traverse.

The Examiner rejected Claims 1, 2, 8 and 9 are rejected under 35 U.S.C. §102(b) as being unpatentable over U.S. Patent No. 5, 369, 995 (Scheinbeim). Applicants respectfully traverse.

The Examiner rejected Claims 1, 2, 9 and 10 are rejected under 35 U.S.C. §102(b) as being unpatentable over U.S. Patent No. 6, 048, 622 (Yamaguchi). Applicants respectfully traverse.

The Office Action rejected claim 1 using piezoelectric effect based prior art (Hagood, Scheinbeim and Yamaguchi). To one of skill in the electroactive polymer arts, piezoelectric materials and electroactive polymers of the present invention are not synonymous. Piezoelectric materials as used in the 1980s, and as disclosed by Hagood, Scheinbeim and Yamaguchi are highly different than the polymers claimed in independent claim 1. Piezoelectric ceramics for example are rigid solids with an elastic modulus typically over 1 GPa. For instance, Hagood teaches (Col. 8, 8-40) that the Youngs Modulus for the polymer is preferably 3-10 GPa.

In contrast, polymers of amended claim 1 are compliant and have an elastic modulus under 100 MPa, and are highly different materials well outside the scope of rigid piezoelectric materials. Therefore, for at least these reasons, Hagood, Scheinbeim and Yamaguchi, can't be to anticipate claims 1-10 and the invention is believed overcome thereby.

Further, piezoelectric ceramics are limited to strains less than 1%, and the rigid piezoelectric polymers employed in the art at the time Hagood, Scheinbeim and Yamaguchi issued were limited to strains less than 3-4%, and thus Hagood, Scheinbeim and Yamaguchi polymers cannot be strained to the degrees described with respect to claims 45-63. For instance, claims 45-54 recite "wherein an elastic area strain between the polymer deflected to a first position with a first area and the polymer deflected to a second position with a second area is at least about 10%." As another example, claims 55-63 recite "wherein an initial area of the portion of the polymer is elastically pre-strained to the first area by a factor in the range of about 1.5

times to 50 times to improve the mechanical response of the transducer when it deflects from the first position to the second position.” The rigid materials described in Hagood, Scheinbeim and Yamaguchi are not capable of the strain limits in claims 45-63. Therefore, for at least these reasons, Hagood, Scheinbeim and Yamaguchi can’t be said to anticipate claims 45-63.

Rejections under 35 U.S.C. § 103

The Examiner rejected Claims 4-7 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6, 048, 622 (Hagood et al). Applicants respectfully traverse.

As described above, the materials in Hagood have a Youngs Modulus between 3-10 GPa or greater. Therefore, for at least these, Hagood can’t be said to render obvious claims 4-7 and the rejection is believed overcome thereby.

Applicant believes that all pending claims are allowable and respectfully requests a Notice of Allowance for this application from the Examiner. Should the Examiner believe that a telephone conference would expedite the prosecution of this application, the undersigned can be reached at the telephone number set out below.

Respectfully submitted,
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